

I CLAIM:

1. A fuel cell testing system comprising:

a safety system for monitoring at least one process and operating parameter during a fuel cell testing trial and evaluating whether at least one alarm threshold has been violated by the at least one process and operating parameter;

a computer usable medium having computer readable code means embodied therein for causing the safety system to suspend the fuel cell testing trial when said at least one alarm threshold has been violated and subsequently to initiate a corresponding alarm recovery sequence for a violated alarm threshold; and

instructions for recording and evaluating measured process and operating parameters in order to determine whether said at least one alarm threshold has been violated.

2. A fuel cell testing system according to claim 1, further comprising a number of sensors, and wherein the computer readable code means comprises:

instructions for polling the sensors to measure the at least one process and operating parameter; and

instructions for evaluating whether or not any one of the alarm thresholds have been violated.

3. A fuel cell testing system according to claim 2, wherein the computer readable code means further comprises:

instructions for suspending the fuel cell testing trial when any one of the alarm threshold has been violated; and

instructions for initiating the corresponding alarm recovery sequence for the violated alarm threshold.

4. A fuel cell testing system according to claim 2, wherein the computer readable code means further comprises:

5 instructions for generating an alarm flag with a respective priority corresponding to the violated alarm threshold.

5. A fuel cell testing system according to claim 2, wherein the computer readable code means further comprises:

10 instructions for generating an alarm flag with a respective priority for each alarm threshold that is violated.

6. A fuel cell testing system according to claim 2, wherein the computer readable code means further comprises:

instructions for suspending the fuel cell testing trial after at least one alarm flag with a respective priority is generated; and

15 instructions for initiating a corresponding alarm recovery sequence for the alarm flag.

7. A fuel cell testing system according to claim 6, wherein the computer readable code means further comprises:

20 instructions for suspending one of the fuel cell testing trial and an executing alarm recovery sequence if at least one other alarm flag, with a higher priority than the alarm flag corresponding to the executing alarm recovery sequence, is generated; and

instructions for initiating the corresponding alarm recovery sequence for the at least one other alarm flag.

8. A fuel cell testing system according to claim 2, wherein the computer readable code means further comprises:

instructions for generating an alarm interrupt with a respective priority for each alarm threshold that is violated.

5 9. A fuel cell testing system according to claim 8, wherein the computer readable code means further comprises:

instructions for suspending the fuel cell testing trial after at least one alarm interrupt with a respective priority is generated; and

10 instructions for initiating a corresponding alarm recovery sequence for the alarm interrupt.

10. A fuel cell testing system according to claim 9, wherein the computer readable code means further comprises:

15 instructions for suspending one of the fuel cell testing trial and an executing alarm recovery sequence if at least one other alarm interrupt, with a higher priority than the alarm interrupt corresponding to the executing alarm recovery sequence, is generated; and

instructions for initiating the corresponding alarm recovery sequence for the at least one other alarm interrupt.

20 11. A fuel cell testing system according to claim 1, wherein the computer readable code means further comprises:

instructions for determining whether or not an executing alarm recovery sequence was effective; and

25 if the alarm recovery sequence is determined to have been not effective, the computer usable medium having computer readable code means embodied therein for causing the safety system to initiate an emergency shutdown of the fuel cell testing trial; alternatively,

if the alarm recovery sequence is determined to have been effective, the computer usable medium having computer readable code means embodied therein for causing the safety system to restart the suspended fuel cell testing trial.

- 5 12. A fuel cell testing system according to claim 1, wherein the computer readable code means further comprising:

instructions for allowing an executing alarm recovery sequence to be interrupted and suspended if an alarm threshold having a higher priority is violated; and

- 10 instructions for initiating another alarm recovery sequence corresponding to the violated alarm threshold with the higher priority.

13. A fuel cell testing system according to claim 12, wherein the computer readable code means further comprises:

- 15 instructions for determining whether or not an executing alarm recovery sequence was effective; and

if the alarm recovery sequence is determined to have been not effective, the computer usable medium having computer readable code means embodied therein for causing the safety system to initiate an emergency shutdown of the fuel cell testing trial; alternatively,

- 20 if the alarm recovery sequence is determined to have been effective, the computer usable medium having computer readable code means embodied therein for causing the safety system to restart one of the suspended fuel cell testing trial and the suspended alarm recovery sequence.

14. A fuel cell testing system according to claim 1, wherein the
25 computer readable code means further comprises:

instructions for carrying out sequence steps that make up a particular alarm recovery sequence.

15. A fuel cell testing system according to claim 1 further comprising a number of regulating devices, the computer readable code means further comprising:

5 instructions for transferring control of the regulating devices to the alarm recovery sequence.

16. A method of controlling a fuel cell testing trial comprising:

measuring at least one process and operating parameter of a fuel cell under test;

10 evaluating the at least one process and operating parameter to determine whether at least one alarm threshold has been violated by said at least one process and operating parameter;

suspending the fuel cell testing trial if at least one alarm threshold has been violated; and

initiating an alarm recovery sequence.

15 17. A method according to claim 16 further comprising:

determining whether or not the alarm recovery sequence was effective; and

if the alarm recovery sequence was not effective, terminating the fuel cell testing trial; alternatively,

20 if the alarm recovery sequence was effective, restarting the suspended fuel cell testing trial.

18. A method according to claim 16 further comprising:

generating an alarm flag with a respective priority for each violated alarm threshold.

19. A method according to claim 18 further comprising:
processing alarm flags in order of priority.
20. A method according to claim 16 further comprising:
generating an alarm interrupt with a respective priority for each
5 violated alarm threshold.
21. A method according to claim 20 further comprising:
processing alarm interrupts in order of priority.
22. A method according to claim 21 further comprising:
suspending an executing alarm recovery sequence if an another
10 alarm threshold having a higher priority is violated; and
initiating another alarm recovery sequence corresponding to the
another violated alarm threshold.
23. A method according to claim 22 further comprising:
determining whether or not the another alarm recovery
15 sequence was effective; and
if the another alarm recovery sequence was not effective,
terminating the fuel cell testing trial; alternatively,
if the another alarm recovery sequence was effective, restarting
one of the suspended fuel cell testing trial and the suspended alarm recovery
20 sequence.